



UID Forum

Implementation Strategies for Programs and Suppliers

Item Unique Identification (IUID) Basics Tutorial 101

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DoD: Facing new challenges

Challenges:

- *Rapidly moving forces on a dynamic battlefield*
- *Demand for better information on assets*
- *Need for more effective visibility and management of inventory*



How we will meet them:

- *Improve business processes now*
- *Improve confidence*
- *Influence the direction and cost of technology development*
- *Drive the standards to work for us*
- *Facilitate the*



IUID: What makes it so special?

IUID...

- Provides “*The Key*” to discovery and correlation of item, real property and human resource information so DoD can *consistently locate, control and value assets* anywhere and anytime
- Enables *globally accessible and secure enterprise data*
- Registries enable *creation of IUID mission critical services* to:
 - Translate legacy data for existing DoD systems
 - Enable access for operational support



Back to the Future

"I think the industry has sold itself on a program that offers so little return that it simply won't be worth the trouble and expense"



Discussing the potential
of the barcode in 1975*

*“Scanning Hits a Snag,” Progressive Grocer, December 1



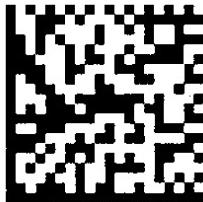
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1D Barcode

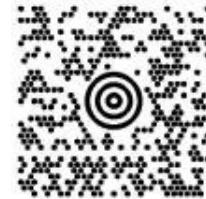
2-D Barcodes



Data Matrix



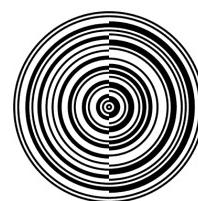
QR Code



MaxiCod



PDF417



Bullseye



Aztec

Automatic Identification

Technology

Contact

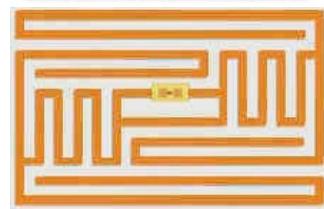
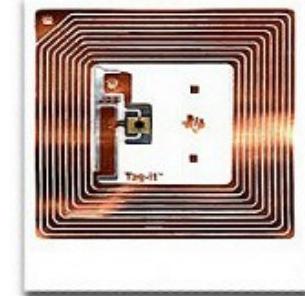
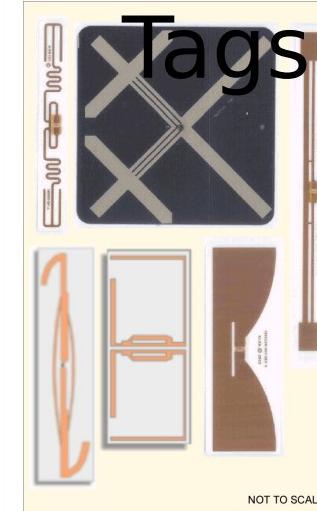


Memory



Buttons

Passive RFID



Active RFID Tags





UID Hierarchy

- Unique Identification (**UID**) is a system of identifying entities to distinguish them from each other.
- Item Unique Identification (**IUID**) is a system of marking items with Unique Item Identifiers (UIIs) that distinguish them from all other like and unlike items.
- Other efforts include:
 - Real Property Unique Identification (RPUID)
 - Acquisition Program Unique Identification (APUID)
 - System Unique Identification (SYSUID)
 - Organization Unique Identification (OUID)
 - Internal DoD (FMID)
 - External to DoD (CAGE, DUNS, etc.)



What Does IUID Provide?

Uniquely identifying tangible items will provide the “**data key**” to item life cycle traceability in DoD business processes and information systems and provide reliable and accurate data for management, financial,

~~Reaccountability of new SoI items since 1 January 2004~~
management purposes.

AND

Legacy item compliance mandatory between 2008 and 2015

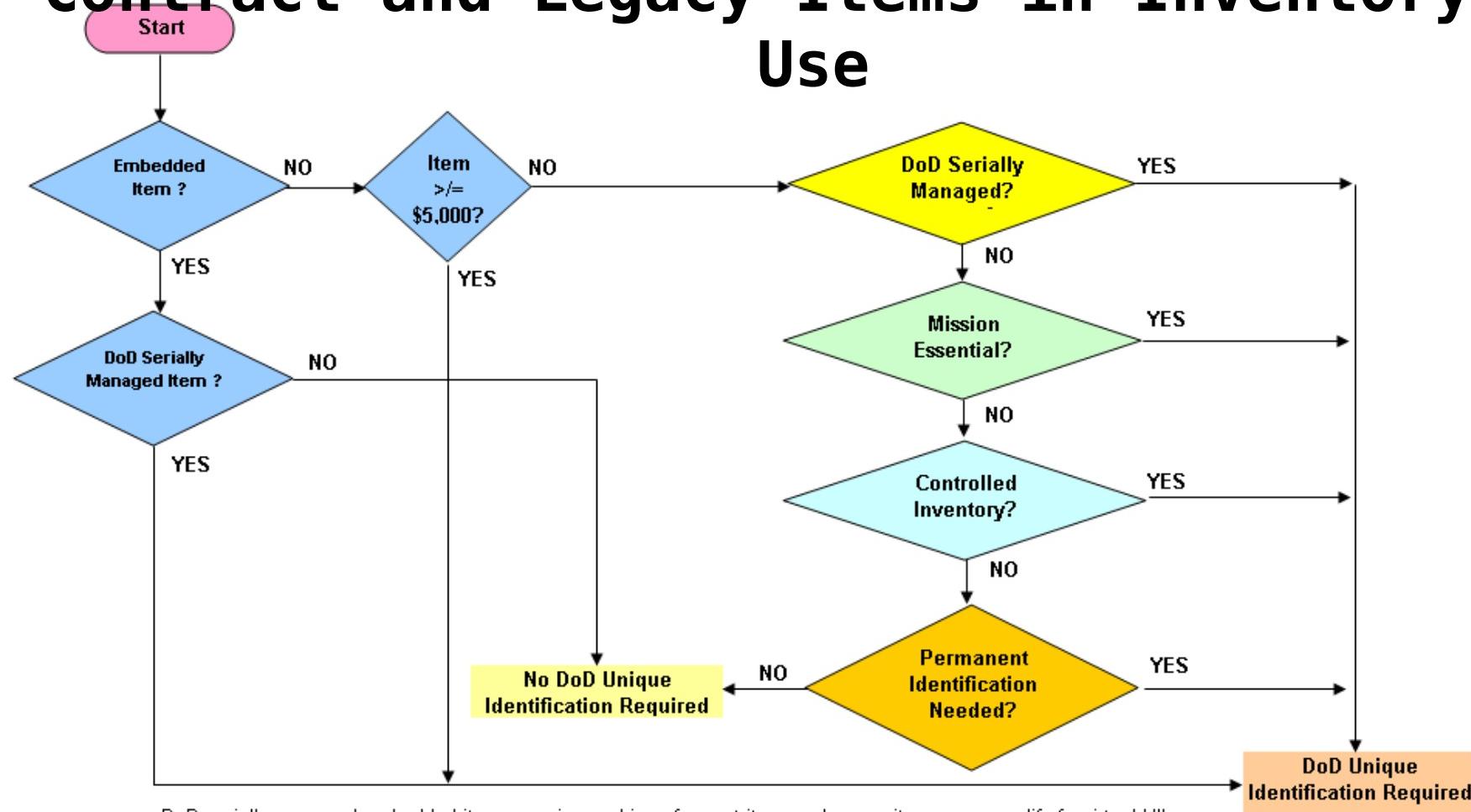


IUID Policy Overview

- Policy memorandum released on July 29, 2003 (with subsequent updates) established IUID as a mandatory DoD requirement on all solicitations issued on or after January 1, 2004.
- IUID is required for all property items delivered to the Government if:
 - *Acquisition cost is greater than or equal to \$5,000*
 - *Items with an acquisition cost below \$5,000, when identified by the requiring activity as DoD serially managed, mission essential, or controlled inventory*
 - *Items with an acquisition cost below \$5,000 as determined by the requiring activity*
 - *Regardless of value, any DoD serially managed subassembly, component or part embedded within an item and the “parent” item in which it is embedded*
- Wide Area Workflow (WAWF) is the preferred method for capturing IUID data and is the mandatory DoD invoicing system



Uniquely Identifying Items Delivered Under Contract and Legacy Items in Inventory or Use



- DoD serially managed embedded items require marking of parent items
- Legacy items may qualify for virtual UU



Key Direction from IUID Policy Updates

- **Apply IUID to legacy items in inventory and operational use**
- **All program and item managers plan for and implement IUID**
 - ACAT 1D programs submitted plans by June 2005
 - All others to MDAs by January 2006
 - All new programs must submit a plan as part of their System Engineering Plan
- **Government Furnished Property (GFP) must meet IUID policy requirement effective 1 Jan 2006**
- **Plans targeted FY2007 as the point by which:**
 - All existing serialized assets will be entered in IUID Registry
 - UII marking capabilities established such that marking can commence when equipment is returned for maintenance



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Key Direction from IUID Policy Updates

- **DUSD (Logistics and Material Readiness)** develop IUID implementation plan for organic depot maintenance operations
- **Jan 2007:** OUSD Materiel Readiness & Maintenance Policy released "Implementing Item-Unique Identification in DoD Maintenance" (dated 31 Jan 07)
 - The Concept of Operations for IUID-Enabled Maintenance in Support of DoD Materiel Readiness
- **14 March 2008:** Memo Under Secretary AT&L John Young.
 - Policy for IUID of Tangible Personal Property – Oversight of IUID Implementation Planning and Execution
- **16 June 2008:** DoDI 8320.04 Item Unique Identification (IUID) Standards for Tangible Personal Property
 - <http://www.dtic.mil/whs/directives/corres/pdf/832004p.pdf>
- **3 Aug 2009:** Under Secretary AT&L Ashton Carter, "Preservation and Storage of Tooling for Major Defense Acquisition Programs (MDAPs)"
 - Requires IUID and the planning for Preservation and Storage of Tooling or prior to Milestone C (SEP) and at Milestone C (LCSP)



System Engineering Requirement

- AT&L Memo-Implementation Planning & Execution 14 March 2008
 - System Engineering Plan
 - Describe overall IUID Implementation Strategy to include
 - Requirements Generation
 - Marking
 - Data Submission
 - Describe role of IUID in program sustainment strategy
 - List Metrics
 - Implementation Timeline
 - Life Cycle Supportability
 - Property accountability & management and financial accounting enabled by IUID
 - Incorporate capability to use IUID in all new Automated Information Systems (AIS) used for management of property
- DODI 5000.02 “Operation of the Defense Acquisition System, 2 December 2008
 - IUID Implementation Plan required per DoD Instruction 8320.04
 - Milestone A (summarized in SEP)
 - Milestone B (annex to SEP)
 - Milestone C (annex to SEP)



AT&L Memo DoDI 8320.04

- Directed all procurement organizations to verify to their Component Acquisition Executive by 15 January 2009 that the IUID clause will be included in all new contracts for which DoDI 8320.04 mandates IUID.
- Established the requirement for Investment Review Board (IRB) criteria compliance
- Directed a change in the requirement for program and item managers to complete IUID marking and registration by December 31, 2015 for selected items
 - all existing Class II (Expendables)
 - all existing Class IX (Repair Parts)
 - embedded assets
- ***For all other legacy items December 31, 2010 remains the target date for compliance***
- Established the Legacy Parts Implementation Working Group
 - All TUID items that have a data plate or label be marked and registered as they are processed by depot maintenance activities



Key Responsibilities for IUID

Implementation

➤ New Acquisition

- **Program Management Office:** Identify items requiring unique identification, including embedded subassemblies, components and parts and ensure functional requirements to implement are complete
- **Contracting Officers:** Include DFARS clause 252.211-7003, Item Identification and Valuation, in all contracts that require delivery of items.
- **Contractors:** Provide IUID marking in accordance with MIL-STD-130, Identification Marking of U.S. Military Property (current version)

➤ Legacy Items in Inventory or already on contract

- **Program Management Office:** Implement a marking and registration plan that includes both end items and embedded subassemblies, components and parts
- **Engineering/Design Authority:** Define marking



Defining the Scope of the UII

A UII Is	A UII Is Not
<ul style="list-style-type: none">➤ A Data Element➤ A Unique Identifier for an Item➤ Globally Unique➤ Unambiguous➤ Permanent➤ Created by Concatenating Specific Data Elements➤ The enabler for business intelligence	<ul style="list-style-type: none">➤ A Device for Communicating Data, such as Radio Frequency Identification (RFID) Tags, Contact Memory Buttons, Linear Bar Codes, or 2-D Data Matrices➤ A Replacement for the National Stock Number➤ Intelligent Data that Yields Information About the Item➤ Transferable from one item to another



Unique Item Identifier (UII) is...

UII
is . . .

. . . the set of data for tangible assets that is globally unique and unambiguous, ensures data integrity and data quality throughout the life of the component, and supports multi-business ions and users.

EID
(12V)194532636

Orig. Part No.

(1P)1234



Serial No.

(S)786950



Create and Generate the UII

The components that make up the UII are identified in the table below. Each enterprise has two or

	UII Construct #1	UII Construct #2
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part Number
UII is derived by concatenating the data elements IN ORDER:	Issuing Agency Code* Enterprise ID Serial Number	Issuing Agency Code* Enterprise ID Original Part Number / Lot or Batch Number Serial Number
Data Identified on Assets Not Part of the UII (Separate Identifier)	Current Part Number** Other Traceability Number***	Current Part Number ** Other Traceability Number***

*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (e.g., Dun and Bradstreet, EAN.UCC). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.

** In instances where the original part number changes with new configurations (also known as part number roll), the current part number may be included on the item as a separate data element for traceability purposes.

*** The data identifier 30T has been designated for use as a traceability number that is not part of the UII. For example, applications may specify 30T for encoding lot or batch number when the lot or batch number is not required or desired in the UII.



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Data Qualifiers Identity the encoded data elements

Data Element	DI (Format 06)	AI (Format 05)	TEI (Format 12)
Enterprise Identifier CAGE/NCAGE DUNS GS1 Company Prefix DoDAAC Other Agencies	17V 12V 3V 7L 18V		CAG, MFR, or SPL DUN EUC
Serial Number within Enterprise Identifier			SER or UCN
Serial Number within Original Part Number	S	21	SEQ
Original Part Number	1P	01	PNO
Lot/Batch Number	1T		LOT, LTN, or BII
Complete UII IUID Equivalents VIN ESN GRAI GIAI	25S I 22S	8002 8003 8004	UID
Unique item identifier (not including the MAC	18S		USN or UST



IUID Basic Tenants - Marking

A compliant IUID Mark – Syntax &

Semantics: The syntax of ISO/IEC 15434, either of the three formats (TEIs, AIs, or DIs) can be used and Construct #1 (serialization within company), Construct #2 (serialization within Part/Lot/Batch) or DoD accepted equivalent are acceptable.

- This interoperability of formats permits enterprises to use their prevailing machine-readable marking processes
- Resulting Unique Item Identifier (UII) is globally unique

GS1: Application Identifiers (AIs)

[]>^R_S05^G_S800406141411A0B9C3D6^R_SE0_T

MH 10.8.2: Data Identifiers (DIs)

[]>^R_S06^G_S17V0CVA5^G_S1P1234^G_SS786950^R_SE0_T

UII Construct #2

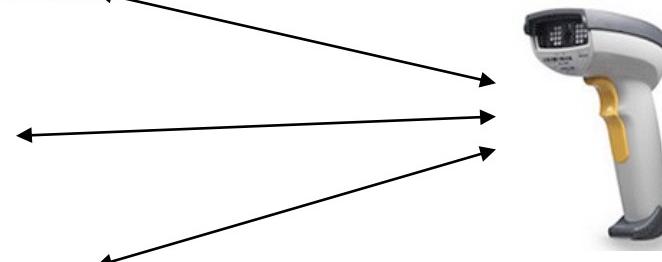
EID	(12V)194532636
Orig. Part No.	(1P)1234
Serial No.	(S)786950



UN1945326361234786950

IAC DUNS Orig. Serial No.
Part No.

This example uses MH10.8.2 Data Identifiers.

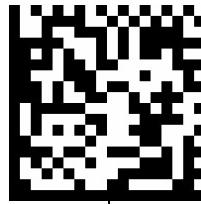




Create and Generate the UII, continued

An imaging device, or scanner, will “read” the mark and detect the encoded data string. The information system will determine what data is retained (i.e., UII, serial number, etc.)

[)>^R_S06^G_S17V0CVA5^G_S1P1234^G_SS786950^R_SE_O_T



The concatenated UII

→ D0CVA51234786950

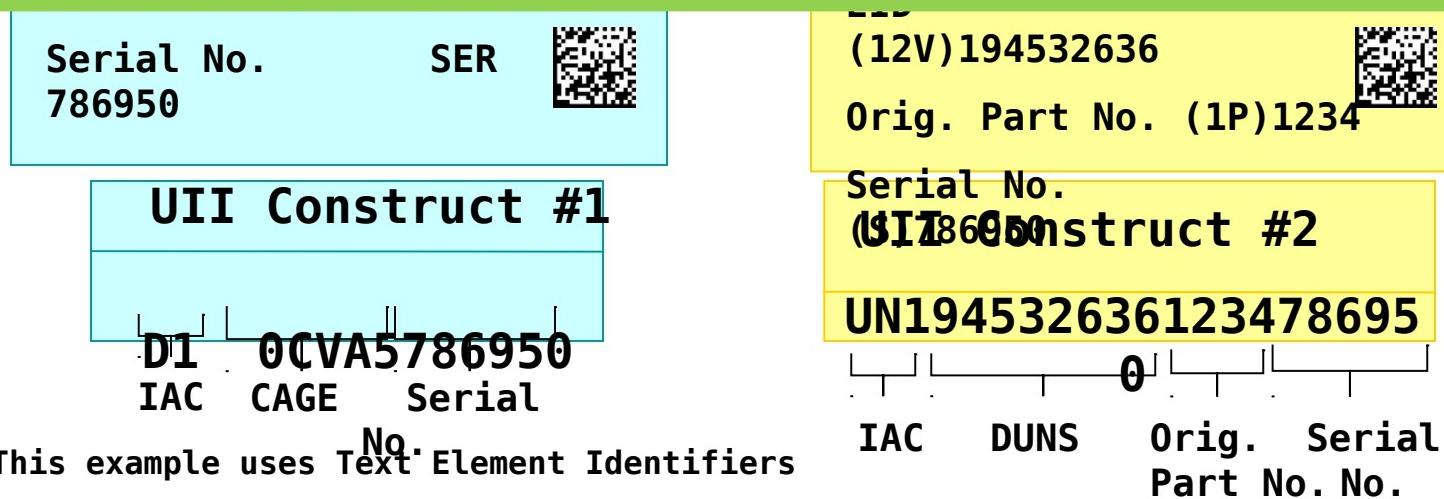


Create and Generate the UII, continued

BUSINESS RULES

The UII shall be derived from its discrete component data elements.

The UII is not required to be marked on the item as a separate data element.*



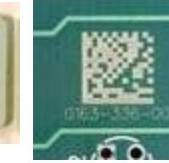
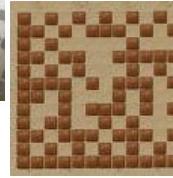
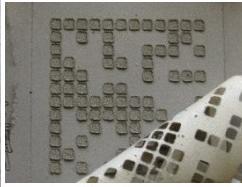
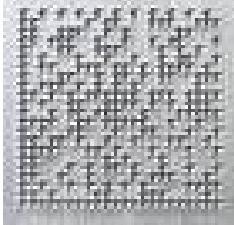
¹ This example uses Text Element Identifiers

² This example uses MH10.8.2 Data Identifiers.

*If the enterprise chooses to mark the UII as a discrete data element on the item, the component data elements must also be marked on the item as discrete data elements, in



Marking Techniques



- Labels (Stickers)
- Data Plates
- Dot Peen
- Laser Etch
- Chemical Etch
- Silk Screening
- Thermal Spray
- Ink Jet Printing
- Laser Ablation
- Laser “Annealing”
- Cast/Forged
- Laser Bonding
- Embroidery
- Photo Etch

Compliant UII marks are optically read...so almost any marking method will work!



Marking Considerations

- First leverage existing marking methods and tools
 - IUID does require a 2D ECC 200 Data matrix, but does not dictate the marking method used other than **permanency and durability requirements**
- If parts are currently marked with data plates or labels, IUID should be incorporated into the existing marking practice where possible.
- Organizations should explore the multiple ways to manage technical documentation and updates to minimize implementation costs.
 - NSWS Corona currently designing additional tests
- Implement the Marking Guidance
 - Central references should be updated if possible vice drawings



Applying the UII

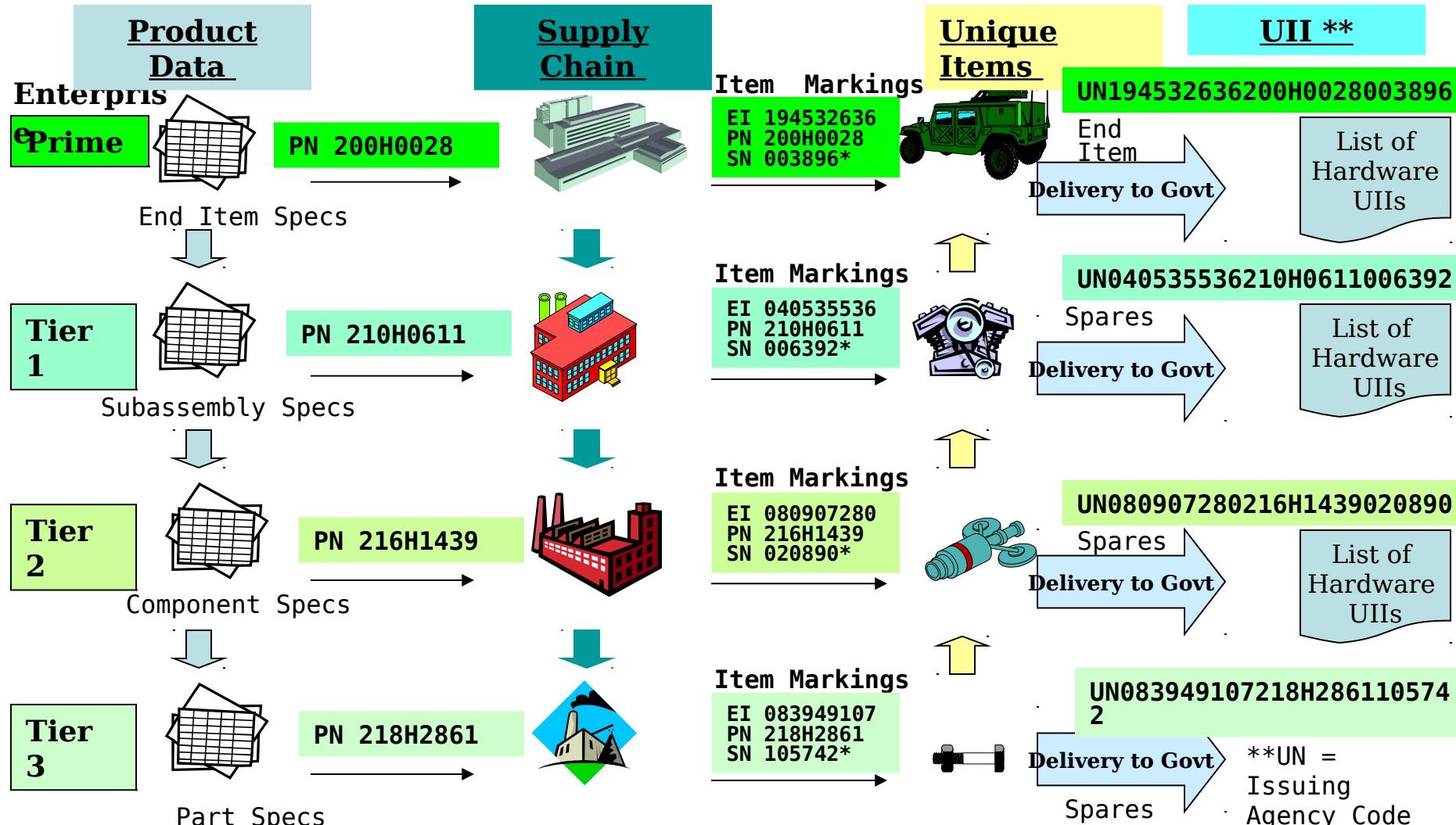
- **Vendor-Applied-at-Source:** Marking applied when item is manufactured
- **Opportunity-Based Item Application:** Can be done in the field or factory, wherever it is convenient to gain access to items either on an end item or available in a storage facility (phase maintenance, scheduled servicing, depot rebuild or overhaul processes, and work-order processes during modification)
- **Seek-and-Apply:** Used for particular items held within service, either at the end item or in storage. This strategy is dependent on establishing the location and availability of items before deployment of application equipment and teams. This approach is dependent upon good legacy data, and will demand greater overhead of coordinated effort to effect access to the assets.
- **Gated:** The interception of items as they transit specific gates within the supply chain. After identification, the situation can be resolved by diverting the item back to the vendor for application, provision of an application capability at the specific supply gate, or diversion of the item to a centralized application facility.



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IUID in the Acquisition System



UII = Unique Item Identifier; EI = Enterprise Identifier

* Serialized within the part number using DUNS as EI

**UN =
Issuing
Agency Code
for DUNS



DoD UII Equivalents

➤ Criteria for Determining DoD IUID Equivalents

- Must contain an enterprise identifier which is assigned by a registration or controlling authority
- Must uniquely identify an individual item within an enterprise identifier, product or part number
- Must have an existing Data Identifier (DI) or Application Identifier (AI) listed in ANSI MH10.8.2, Data Identifier and Application Identifier Standard

➤ Identifiers Meeting the Equivalence Criteria

- Global Individual Asset Identifier (GIAI) EAN.UCC (AI:8004)
- Global Returnable Asset Identifier (GRAI), EAN.UCC (AI: 8003)
- Vehicle Identification Number (VIN) ISO 3779 (DI: 1)
- Electronic Serial Number (ESN) - cellular



Marking Items

**DoD Guide to
Uniquely
Identifying Items
V2.0 (October 1,
2008)**

**Appendix D – The
Mechanics of
Item Unique
Identification**

**Addresses
Constructs 1 & 2**

Department of Defense Guide to Uniquely
Identifying Items



Assuring Valuation, Accountability and
Control of Government Property

Version 2.0
October 1, 2008

Office of the Deputy Under Secretary of Defense
(Acquisition, Technology & Logistics)



Marking Items

MILSTD 130N

DoD Standard Practice
[for] Identification of
U.S. Military Property
17 December 2007
[Supersedes "M"]

Establishes quality requirements

Provides “*further clarification and increased insight and guidance for the implementation of machine-readable information (MRI) for item identification marking and automatic data*

NOT MEASUREMENT SENSITIVE

MIL-STD-130N
17 December 2007

SUPERSEDING
MIL-STD-130M
w/Change 1
15 June 2007

DEPARTMENT OF DEFENSE
STANDARD PRACTICE
IDENTIFICATION MARKING OF
U.S. MILITARY PROPERTY



AMSC N/A

DISTRIBUTION STATEMENT A. Approved for public release, distribution is unlimited.

AREA SESS



Business Rules for UII Construction & Physical Marking

- DoD organizations may not dictate to the Contractor either the UII construct, semantics, serialization or the use of the Government's Enterprise Identifier
- If UII Construct #2 is used, the enterprise must maintain the original part number on the item for the life of the item
- The UII will not change over the life of the item. Therefore the component data elements of the UII will not change over the life of the item
- Where space is available, human readable information for UII data elements shall be marked on the item.



Virtual UIIs

- UIIs can be assigned in advance of items being physically marked, only:
 - For legacy items already in inventory or operational use
 - For government property in the possession of contractors
- Certain conditions apply:
 - Requires serialized identity data to have been previously marked on item
 - Requires Virtual UII registration in the UID Registry
 - Identifies item until a trigger for physical marking (maintenance, etc.) at which point the

Use Virtual
UII
cautiously!



AIDC Benefits

Automatic Identification and Data Capture

- Reduces human error in inventory control
- Reduces manpower hours spent in data entry
- Creates capabilities to identify items and histories (e.g., source, usage, and maintenance)
- Enables specific item tracking throughout supply chain and operational use worldwide



IUID Registry

➤ Purpose:

Collect IUID and pedigree information of tangible items owned by DoD
Distribute IUID and pedigree information to DoD users
Provide single point of reference for DoD tangible items that have assigned Unique Item Identifiers

➤ Operational Environment:

IUID Registry – database located in Battle Creek, MI
Operated by Defense Logistics Information Service (DLIS)

Resides on Business Process Network backbone

➤ Submit Data

By WAWF

XML or flat file through GEX

Manually via IUID Web Entry Site

<http://www.bpm.gov/iuid>

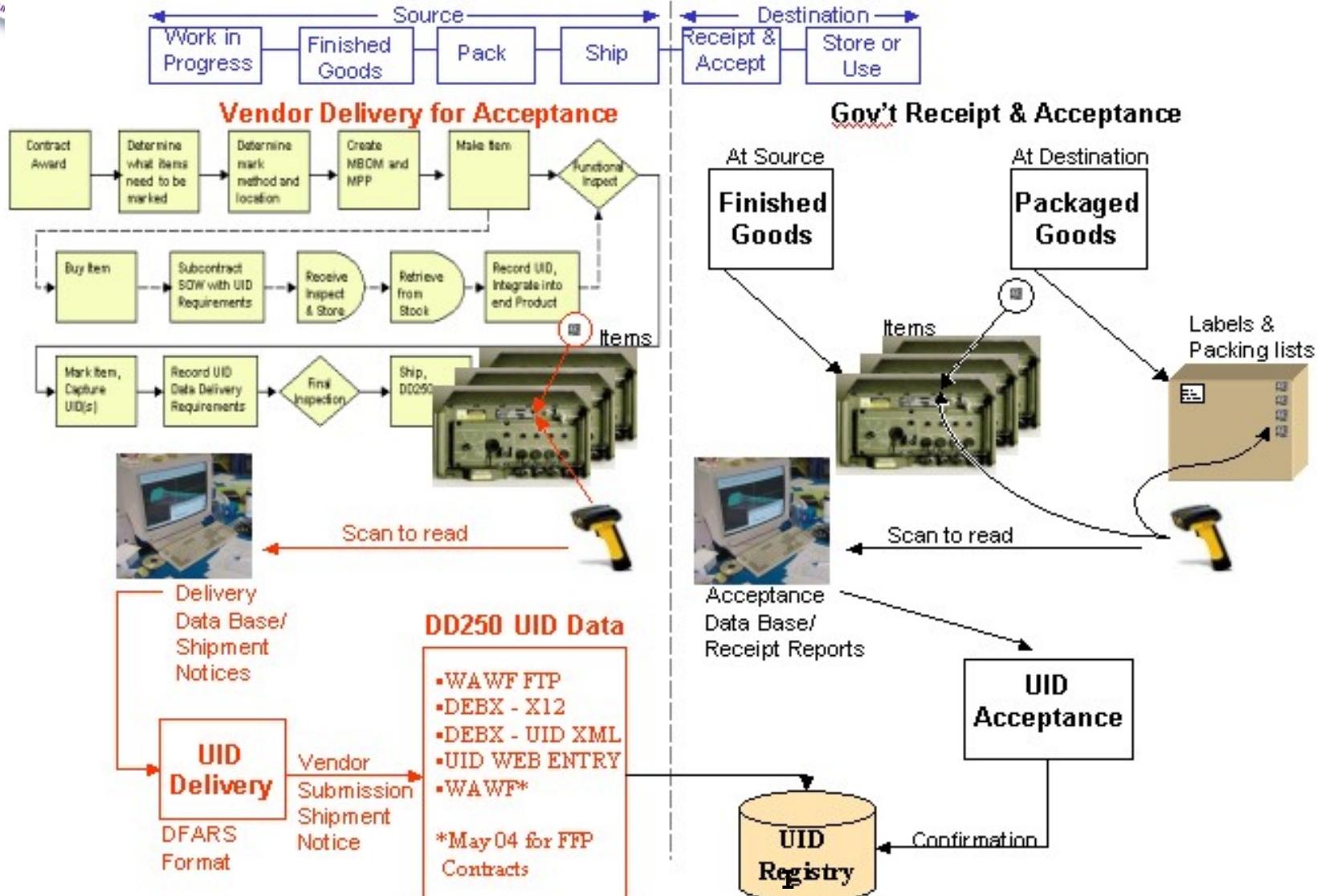


Rapidly
Growing!



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IUID-RFID Relationship

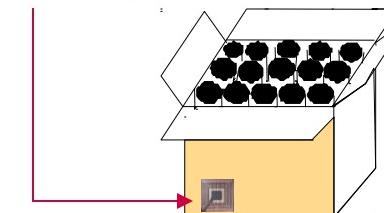
RFID tags that carry data are required to be attached to packages at multiple levels, including item packages, cases, and pallets. Unique Item Identifiers are required to be attached or directly marked on items using a data matrix to carry the UII data elements.



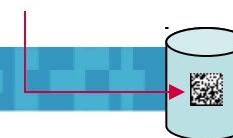
RFID Tag (Pallet Level)

RFID Tag (Case Level)

RFID Tag (Item Package Level)



IUID Data Matrix (Item Level)





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Online Resources Official DoD UID Policy Office Website

www.uniqueid.org

Comprehensive resource of UID and IUID policies, standards, directives,
videos and success stories.

Be sure to sign up for the *IUID in Action* eNewsletter!

defensepolicysupport@epsc.org or 1.877.376.5787

Defense Acquisition University

www.dau.mil

DAU offers 2 distinct online courses to increase your IUID knowledge

CLF040 "Item Unique Identification Marking" and CLM200
ORLANDO 2009 "Item Unique Identification" SLIDE 35



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QUESTIONS?



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Back-Up Slides